

Atrial Fibrillation

A Guide to Patient Impact,
Disease Management and
Treatment Outcomes



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a new possible™



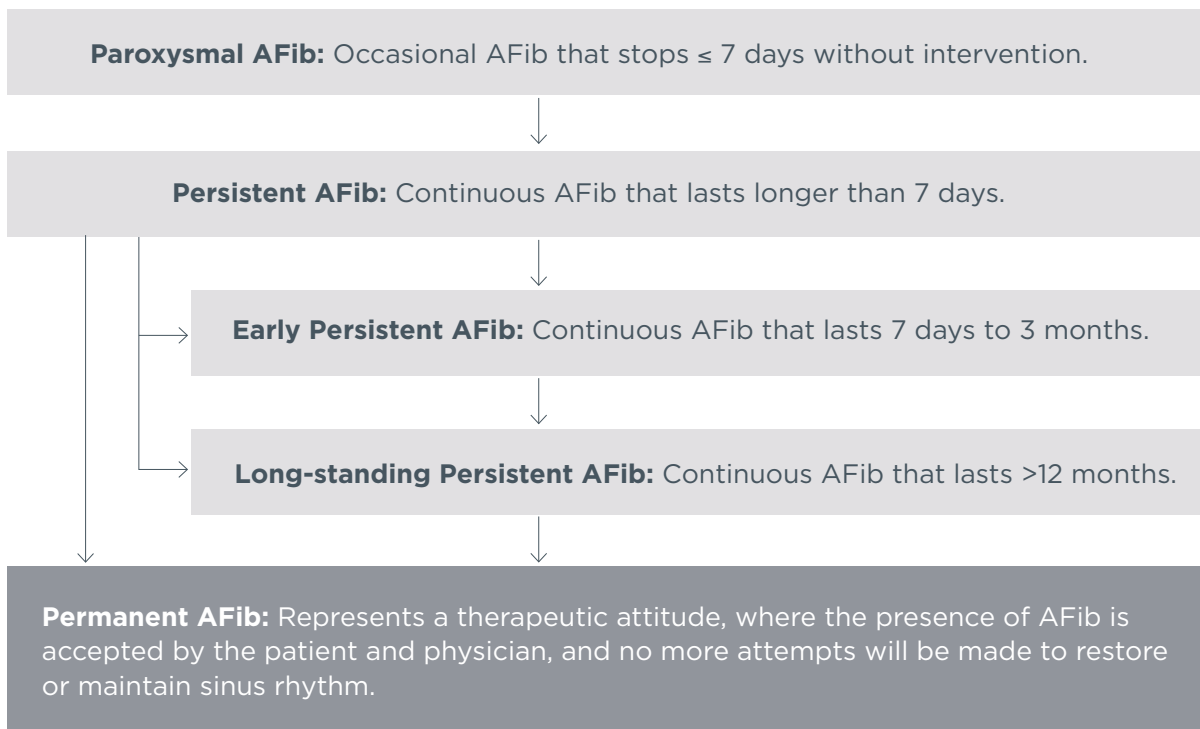
Overview	4
Understanding AFib and its impact on patients	
AFib Management Guidelines	6
Guidelines and recommendations for AFib treatment	
Treatment of AFib Patients	7
Current treatment options available for managing AFib	
Drug Therapy	8
The impact of antiarrhythmic drug therapy in managing AFib	
Catheter Ablation	10
The impact of catheter ablation in managing AFib	
Comparison of Treatment	12
Catheter ablation compared to drug therapy for AFib management	
Studies and Disparities in AFib treatment	13
Recent studies in AFib treatment and healthcare disparities	
AFib treatment pathways	14
Impact of multidisciplinary AFib treatment pathways	
Conclusion	15
References	16

Understanding AFib and its impact on patients



Atrial Fibrillation (AFib) is characterized by an irregular and often fast heartbeat that results in uncoordinated contraction of the atria.¹

AFib is the most common type of cardiac arrhythmia affecting up to 6 million people in the U.S. and is projected to increase up to 7.2 million by 2035.² In the US, there are 160,000 new cases of AFib diagnosed per year, causing over 454,000 hospitalizations and 158,000 deaths.³

AFib can be categorized into several types:⁴⁻⁵



Risk factors for AFib include:

 <p>LIFESTYLE FACTORS⁴⁻⁵ Obesity Smoking Alcohol consumption Caffeine consumption Stress</p>	 <p>OTHER CONDITIONS⁶⁻¹⁰ High blood pressure Heart failure History of heart attack History of cardiac surgery Coronary artery disease Other heart disease Untreated atrial flutter</p>	 <p>NON-MODIFIABLE FACTORS⁴⁻¹⁰ Older age Family history or other genetic factors Male sex</p>
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Early detection, diagnosis and ablation of AFib may help improve patient outcomes, since a long history and duration of AFib has been associated with recurrence.¹¹

Symptoms of AFib disrupt daily life and range from mild to debilitating.¹²⁻¹⁴

The most common symptoms are:^{15,19-20}

Patients with AFib have an increased risk for life-threatening complications and other diseases:²¹⁻²²

AFIB MANAGEMENT GUIDELINES

Following the diagnosis of AFib, the 2014 AHA/ACC/HRS guidelines recommend an integrated and structured approach to patient care and AFib management that involves multidisciplinary healthcare teams and places patients in a central role in decision-making.²⁴

Oral Anticoagulation Therapy for Stroke Prevention in patients with AFib²⁴	In patients with CHA ₂ DS ₂ -VASc score ≥ 2 , oral anticoagulation is recommended.
Rate Control Therapy to Lower and Control Heart Rate and Improve Symptoms of AFib²⁴	In patients with LVEF <40% or signs of congestive HF, low dose β-blockers are recommended. In patients with LVEF $\geq 40\%$, β-blockers or non-dihydropyridine calcium channel antagonists are recommended. The recommended target heart rate to achieve is <110bpm.
Acute Rhythm Control Therapy to Restore Normal Sinus Rhythm⁴	Pharmacological or electrical cardioversion is recommended when patients have: <ul style="list-style-type: none"> - No or minimal signs of heart disease - Coronary artery disease or left ventricular hypertrophy - Heart failure Electrical cardioversion is recommended when: <ul style="list-style-type: none"> - Hemodynamic instability is present
Rhythm Control Therapy to Maintain Normal Sinus Rhythm and Improve Symptoms of AFib²⁴ Guidelines recommend that treatment with AADs, catheter ablation, and/or surgical ablation be dependent on patient choice. ²⁴	AAD usage: needs to consider the presence of comorbidities, cardiovascular risk, potential for proarrhythmia, toxic effects, symptom burden, and patient preference. ² Catheter ablation recommended in: <ul style="list-style-type: none"> - Symptomatic paroxysmal AFib patients refractory/intolerant to ≥ 1 AADs (Class I or III) Catheter ablation may be considered in: <ul style="list-style-type: none"> - Persistent or long-standing persistent AFib - Congestive HF - Older patients (>75 years) - Younger patients (<45 years) - Hypertrophic cardiomyopathy - Asymptomatic AFib
Selection of 2nd Rhythm Control Therapy After Failure of 1st Rhythm Control Therapy.⁴	After failure of first-line medical therapy or catheter ablation, patients can work closely with multidisciplinary care teams to decide on the most appropriate treatment: <ul style="list-style-type: none"> - Another AAD - Catheter ablation (first or repeat) - Hybrid therapy

Abbreviations: AAD = antiarrhythmic drug; AFib = Atrial Fibrillation; AVR = aortic valve replacement; CABG = coronary artery bypass graft; CHA₂DS₂-VASc = Congestive Heart failure, hypertension, Age ≥ 75 (doubled), Diabetes, Stroke (doubled), Vascular disease, Age 65-74, and Sex (female); HF = heart failure; LVEF = left ventricular ejection fraction

TREATMENT OF AFIB PATIENTS

Current treatment options available for managing AFib

The therapeutic goal of the initial management strategy for AFib is to treat any underlying cardiovascular conditions and reduce the risk of stroke.⁴

RATE CONTROL THERAPIES²⁴



PHARMACOLOGICAL

Beta blockers or non-dihydropyridine calcium channel antagonists, digitalis glycosides, amiodarone or digoxin



SURGICAL

AV node ablation with pacemaker implantation

RHYTHM CONTROL THERAPIES^{4,24}

RHYTHM CONTROL THERAPIES FOR AN EPISODE OF AFIB



ELECTRICAL CARDIOVERSION



PHARMACOLOGICAL CARDIOVERSION

NON-EPISODIC RHYTHM CONTROL THERAPIES



PHARMACOLOGICAL



CATHETER ABLATION



HYBRID THERAPY

When multidisciplinary AFib treatment teams were utilized to select appropriate treatment for AFib patients, **significant reductions in health resource utilization, inpatient admission rate and length of stay** were observed.²⁵⁻²⁷

Significant difference, $p < 0.001$

The impact of antiarrhythmic drug therapy in managing AFib

Antiarrhythmic drug therapy can help to maintain sinus rhythm after cardioversion; antiarrhythmic drugs act to suppress the firing of or depress the transmission of abnormal electrical signals.⁴

CLINICAL IMPACT

Antiarrhythmic drug therapy is safe and moderately effective at maintaining normal sinus rhythm. Its impact on AFib-related complications such as stroke, heart failure, and mortality has been demonstrated in a number of studies.²⁸⁻³²

AADs are moderately effective:

33%-56% | SUCCESS RATES FOR MAINTAINING NORMAL SINUS RHYTHM AT 1 YEAR.²⁸ | **~50%** | OF PATIENTS DO NOT RESPOND TO OR CANNOT TOLERATE MEDICATIONS.²⁹

ECONOMIC IMPACT

Antiarrhythmic drug therapy is initially cost effective, but not superior to the long term cost savings that RF catheter ablation can offer.^{30,33}



Several studies show that AADs are cost effective, with key drivers including reduced adverse events, stroke, and mortality.³⁰⁻³²



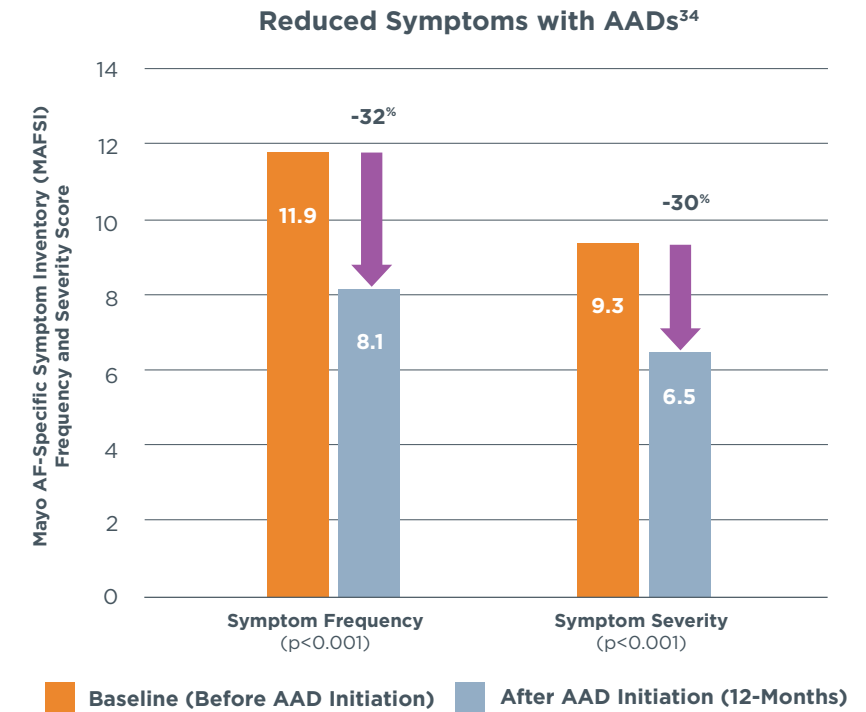
From the payer's perspective, RF catheter ablation was more cost effective than AAD therapy with an estimated mean net monetary benefit of \$8,516 per patient, per year, driven by reduced healthcare utilization cost and improved quality of life.³³



Cost of AAD therapy is influenced by its toxicity level, effectiveness in restoring sinus rhythm and reducing the risk of AFib-related complications.³⁰⁻³²

PATIENT IMPACT

Antiarrhythmic drug therapy can be effective at controlling symptoms of AFib in patients and may improve quality of life.³⁴




Abbreviations: AAD = antiarrhythmic drug; AFib = Atrial Fibrillation

The impact of catheter ablation in managing AFib


Catheter ablation is used to create small scars on targeted parts of heart tissue in order to block the abnormal electrical signals that cause arrhythmias.⁴⁻⁵

CLINICAL IMPACT

Catheter ablation is highly effective at reducing the risk of AFib-related complications, including stroke, heart failure, and mortality. It is also associated with a **reduced risk of dementia**, which is expected to affect 10.5 million Americans by 2050.³⁸



After a single procedure, there was a **84%-94% freedom from atrial arrhythmia** in paroxysmal AFib at 1 year.³⁵⁻³⁷



Compared to AADs, **catheter ablation** was associated with a **41% lower risk of dementia**.³⁸

Reductions in the probability of AF-related complications compared to drug therapy over a 7-year follow-up period:^{40,41}



ECONOMIC COMPARISON OF MEDICAL TREATMENT TO CATHETER ABLATION

Compared to AADs, radiofrequency catheter ablation is associated with a reduction in CV hospitalizations and may have long-term economic benefits which offset higher initial costs.^{41*}

The break-even point for RF catheter ablation was:^{41*}



12-months post-ablation, reductions in healthcare utilization result in:^{41*}

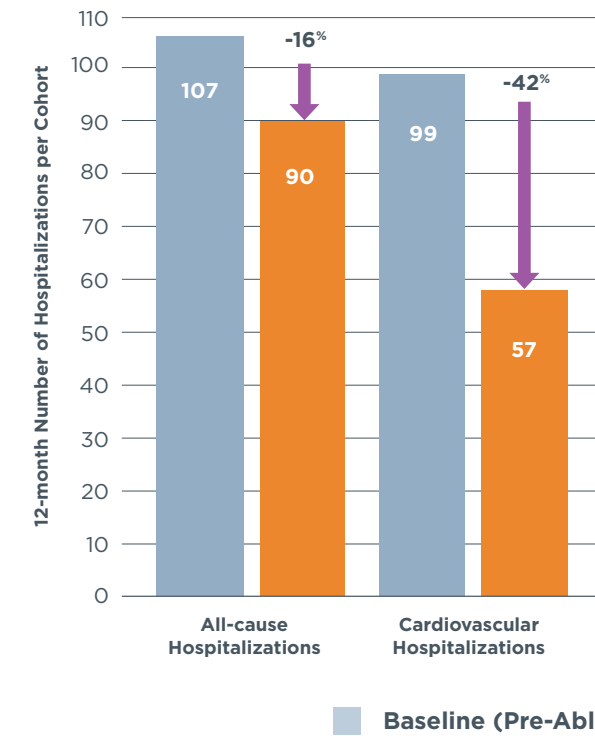


*Break-even and cost-offset analyses assessed the economic impact of radiofrequency catheter ablation vs. medical therapy for the treatment of persistent AFib patients

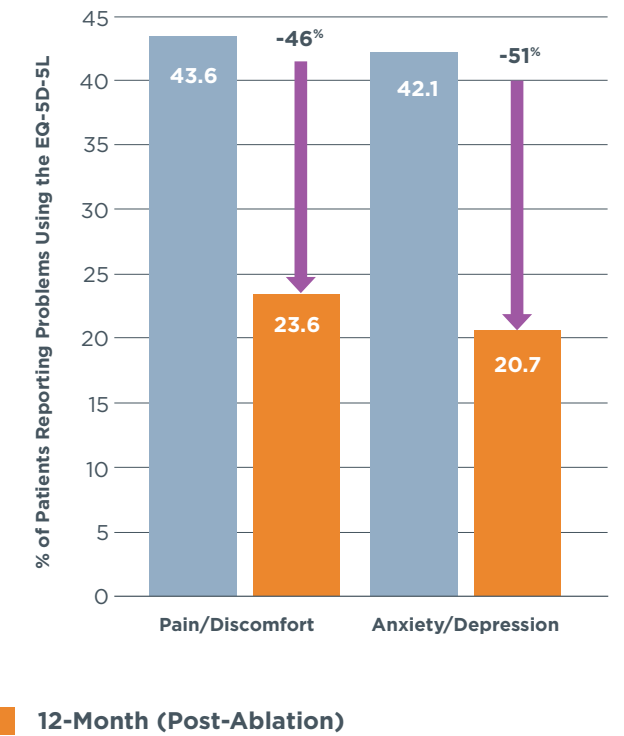
PATIENT IMPACT

Catheter ablation is highly effective at reducing hospitalizations and managing the burdensome physical and mental symptoms of AFib, which may contribute to an improved quality of life.⁴²

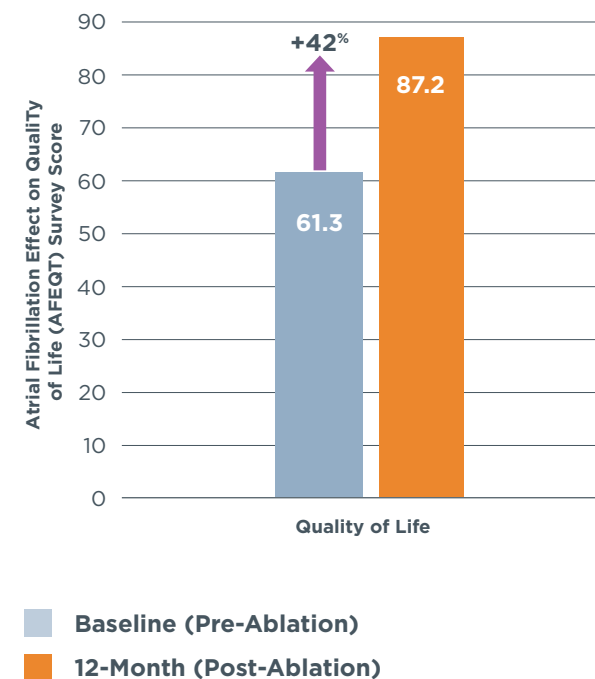
REDUCED HOSPITALIZATIONS⁴²



REDUCED SYMPTOMS⁴²



IMPROVED QUALITY OF LIFE⁴²









- UP TO 42% REDUCTION IN HOSPITALIZATIONS⁴²**
- UP TO 51% DECREASE IN REPORTED SYMPTOMS⁴²**
- UP TO 42% IMPROVEMENT OF QUALITY OF LIFE⁴²**

■ Baseline (Pre-Ablation)
■ 12-Month (Post-Ablation)

COMPARISON OF TREATMENTS

The impact of catheter ablation compared to drug therapy in AFib management

	DRUG THERAPY (AADs)	CATHETER ABLATION
 EFFICACY	33% -56% OF PATIENTS ARE IN NORMAL SINUS RHYTHM AT 1 YEAR ²⁸	UP TO 94% OF PATIENTS ARE FREE FROM ARRHYTHMIA RECURRENCE AT 1 YEAR ³⁵
 QUALITY OF LIFE	UP TO 28% IMPROVEMENT IN QUALITY OF LIFE ³⁴	UP TO 42% IMPROVEMENT IN QUALITY OF LIFE ⁴²
 ADVERSE EVENTS	12% -19% OF PATIENTS WITHDRAW FROM MEDICAL THERAPY DUE TO ADVERSE EVENTS ²⁸	ONLY 1.8% OF ABLATION PATIENTS EXPERIENCE AN ABLATION-RELATED ADVERSE EVENTS ⁴⁰
 COST	\$1,500 REDUCTION IN MEAN PER-PATIENT COST WITH RF CATHETER ABLATION AFTER 7 YEARS ³³	UP TO 35% SAVINGS IN TOTAL TREATMENT COST Catheter ablation was associated with a 35% savings in total treatment cost compared to drug therapy. ⁸
 LOWER RISK OF DEMENTIA	<p>COMPARED TO AADS, CATHETER ABLATION WAS ASSOCIATED WITH AN OVERALL 41% LOWER RISK OF DEMENTIA^{38*}</p> <p><small>*(HR 0.59; 95% CI 0.52-0.67; p<0.0001)</small></p>	

KEY CLINICAL STUDIES AND DISPARITIES IN AFIB TREATMENT

Several landmark clinical studies have underscored the clinical value of catheter ablation in AFib treatment.



The **PRECEPT clinical study** results found that catheter ablation of persistent AFib patients **resulted in long-term effectiveness** and 15 months freedom from symptomatic AFib/AFL/AT in 80% of patients.⁴³



The **VISTAX trial** showed that **89% of patients had freedom from AFib** at 12-months following a catheter ablation.⁴⁴



The **CABANA trial** showed that patients treated with **catheter ablation had a 48% reduction in AFib recurrence** as compared to drug therapy.⁴⁰



The **ATTEST clinical study** demonstrated that catheter ablation may be up to **10 times more effective than standard drug therapy** alone at delaying progression of AFib.⁴⁵



The **CAPT-AF study** indicated that catheter ablation for paroxysmal AFib was associated with **3.8 times greater improvements in overall quality of life** and significantly improved symptom burden compared to medical therapy.⁴⁶

Catheter ablation of persistent AFib has been shown to improve healthcare utilization by reducing hospital admissions and emergency room visits for AFib-related complications.⁴⁷

In the 12 months following an ablation for persistent AFib, relative reductions in healthcare utilization included:⁴⁷

↓ 55%

AFIB-RELATED INPATIENT ADMISSIONS*

↓ 52%

EMERGENCY DEPARTMENT VISITS*

↓ 61%

ELECTRICAL CARDIOVERSIONS*

The reduction in healthcare utilization and outcomes among underrepresented racial and ethnic groups were even more prevalent post ablation.⁴⁷



40%
COMPOSITE OUTCOME UTILIZATION ACROSS ALL RACE/ETHNIC GROUPS**

↓ 52%

BLACK PATIENTS*

↓ 50%

ASIAN PATIENTS**

*Statistically significant (P<0.0001)

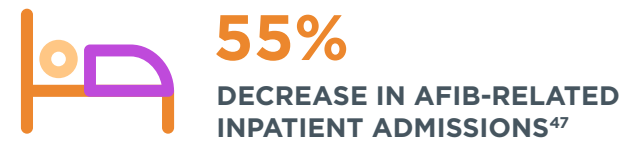
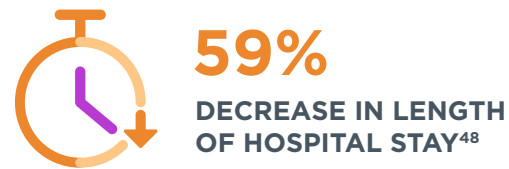
**Statistically significant (P=0.032)

†Composite outcomes included AFib related inpatient, outpatient and ER admissions, as well as cardioversions

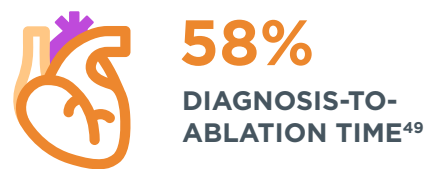
AFIB TREATMENT PATHWAYS

When multidisciplinary AFib treatment pathways were utilized for appropriate treatment for AFib patients, significant reductions in health resource utilization, inpatient admission rate and length of stay were observed.²⁵⁻²⁷

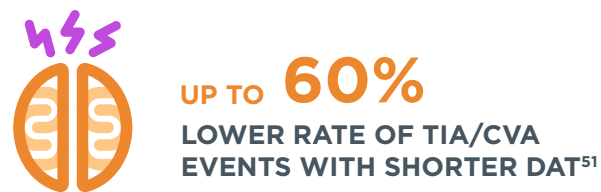
Dedicated ER protocols - such as an **ER AFib pathway** - enable appropriate triage of AFib patients to ensure timely evaluation by EP, which can reduce unnecessary hospitalization for patients.



An integrated care model such as an **AFib clinic** may serve to standardize treatment pathways and decrease diagnosis to ablation time (DAT).

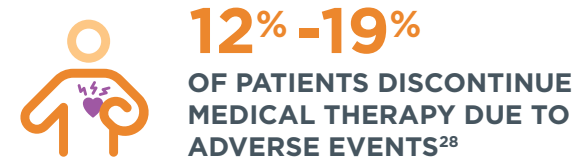
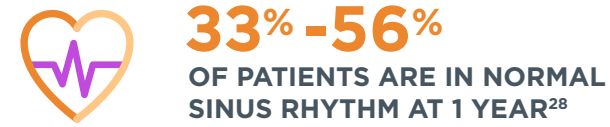


Shorter diagnosis to ablation times (DAT) of AFib improves ablation-related outcomes and may reduce hospitalizations, stroke and mortality.^{24,45,51}



CONCLUSION

With drug therapy treatment:



Antiarrhythmic drug (AAD) therapy is moderately effective.

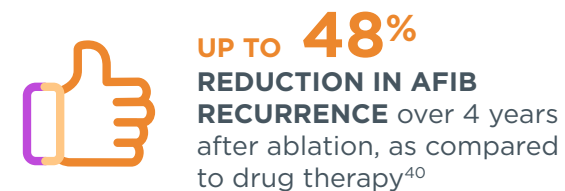
It can improve quality of life in particular patients, however is commonly associated with treatment discontinuation due to adverse events.^{28,34}

With catheter ablation treatment:



Catheter ablation is highly effective and associated with a low rate of procedure-related adverse events. It has been shown to reduce the rate of AFib-related complications, improve quality of life and decrease healthcare resource utilization.

Catheter ablation is more effective than drug therapy at preventing AFib recurrence, provides a significantly greater improvement in quality of life, and is less costly over the long term.



*(HR 0.11; 95% CI 0.025-0.483; p=0.0034.)

REFERENCES

1. Copley, Dianna Jo, and Kathleen M. Hill. "Atrial fibrillation: a review of treatments and current guidelines." AACN Advanced Critical Care 27.1 (2016): 120-128.
2. Khavjou, Olga, D. Phelps, and A. Leib. "Projections of cardiovascular disease prevalence and costs: 2015–2035." Dallas: American Heart Association (2016)..
3. Centers for Disease Control and Prevention, National Center for Health Statistics. About Multiple Cause of Death, 1999–2019. CDC WONDER Online Database website. Atlanta, GA: Centers for Disease Control and Prevention; 2019. Accessed February 1, 2021.
4. Kirchhof P, Benussi S, Kotecha D, Ahlsson A, Atar D et al. (2016) 2016 ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS. Eur Heart J 37 (38): 2893-2962.
5. Calkins H, Hindricks G, Cappato R, Kim YH, Saad EB et al. (2017) 2017 HRS/EHRA/ECAS/APHS/SOLAECE expert consensus statement on catheter and surgical ablation of atrial fibrillation. Heart Rhythm 14 (10): e275-e444.
6. Naser N, Dilic M, Durak A, Kulic M, Pepic E et al. (2017) The Impact of Risk Factors and Comorbidities on The Incidence of Atrial Fibrillation. Mater Sociomed 29 (4): 231-236.
7. Allan V, Honarbakhsh S, Casas JP, Wallace J, Hunter R et al. (2017) Are cardiovascular risk factors also associated with the incidence of atrial fibrillation? A systematic review and field synopsis of 23 factors in 32 population-based cohorts of 20 million participants. Thromb Haemost 117 (5): 837-850.
8. Nystrom PK, Carlsson AC, Leander K, de Faire U, Hellenius ML et al. (2015) Obesity, metabolic syndrome and risk of atrial fibrillation: a Swedish, prospective cohort study. PLoS One 10 (5): e0127111.
9. Boriani G, Proietti M (2017) Atrial fibrillation prevention: an appraisal of current evidence. Heart.
10. Lloyd-Jones, Donald M., et al. "Lifetime risk for development of atrial fibrillation: the Framingham Heart Study." Circulation 110.9 (2004): 1042-1046
11. Scherr D, Khairy P, Miyazaki S, Aurillac-Lavignolle V, Pascale P et al. (2015) Five-Year Outcome of Catheter Ablation of Persistent Atrial Fibrillation Using Termination of Atrial Fibrillation as a Procedural Endpoint.
12. Nazli C, Kahya Eren N, Yakar Tuluca S, Kocagra Yagiz IG, Kilicaslan B et al. (2016) Impaired quality of life in patients with intermittent atrial fibrillation. Anatol J Cardiol 16 (4): 250-255.
13. Rho RW, Page RL (2005) Asymptomatic atrial fibrillation. Prog Cardiovasc Dis 48 (2): 79-87.
14. Guerra F, Brambatti M, Nieuwlaat R, Marcucci M, Dudink E et al. (2017) Symptomatic atrial fibrillation and risk of cardiovascular events: data from the Euro Heart Survey. Europace 19 (12): 1922- 1929.
15. Rienstra M, Lubitz SA, Mahida S, Magnani JW, Fontes JD et al. (2012) Symptoms and functional status of patients with atrial fibrillation: state of the art and future research opportunities. Circulation 125 (23): 2933-2943.
16. Nieuwlaat R, Prins MH, Le Heuzey JY, Vardas PE, Aliot E et al. (2008) Prognosis, disease progression, and treatment of atrial fibrillation patients during 1 year: follow-up of the Euro Heart Survey on atrial fibrillation. Eur Heart J 29 (9): 1181-1189.
17. De Vos CB, Pisters R, Nieuwlaat R, Prins MH, Tieleman RG et al. (2010) Progression from paroxysmal to persistent atrial fibrillation clinical correlates and prognosis. J Am Coll Cardiol 55 (8): 725-731.
18. Dilaveris PE, Kennedy HL (2017) Silent atrial fibrillation: epidemiology, diagnosis, and clinical impact. Clin Cardiol 40 (6): 413-418.
19. Zoni-Berisso M, Lercari F, Carazza T, Domenicucci S (2014) Epidemiology of atrial fibrillation: European perspective. Clin Epidemiol 6 213-220.
20. Lip GY, Laroche C, Ioachim PM, Rasmussen LH, Vitali-Serdoz L et al. (2014) Prognosis and treatment of atrial fibrillation patients by European cardiologists: one year follow-up of the EURObservational Research Programme-Atrial Fibrillation General Registry Pilot Phase (EORP-AF Pilot registry). Eur Heart J 35 (47): 3365-3376.
21. CDC Atrial Fibrillation Fact Sheet, 2017 Centers for Disease Control and Prevention (CDC) webpage on Atrial Fibrillation. www.cdc.gov accessed 07.29.2020.
22. Odutayo A, Wong CX, Hsiao AJ, Hopewell S, Altman DG et al. (2016) Atrial fibrillation and risks of cardiovascular disease, renal disease, and death: systematic review and meta-analysis.
23. Coleman CI, Coleman SM, Vanderpoel J, Nelson W, Colby JA et al. (2012) Factors associated with 'caregiver burden' for atrial fibrillation patients. Int J Clin Pract 66 (10): 984-990.
24. January, Craig T., et al. "2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the Heart Rhythm Society." Journal of the American College of Cardiology 64.21 (2014): e1-e76.
25. Ptaszek LM, White B, Lubitz SA, et al. Effect of a Multidisciplinary Approach for the Management of Patients With Atrial Fibrillation in the Emergency Department on Hospital Admission Rate and Length of Stay. Am J Cardiol. 2016;118(1):64-71.
26. Rush KL, Burton L, Schaab K, Lukey A. The impact of nurse-led atrial fibrillation clinics on patient and healthcare outcomes: a systematic mixed studies review. Eur J Cardiovasc Nurs. 2019;18(7):526-533.
27. Tran, Huyentran N et al. A multidisciplinary atrial fibrillation clinic. Current cardiology reviews vol. 9,1 (2013): 55-62. doi:10.2174/157340313805076287
28. Lafuente-Lafuente C, Valembois L, Bergmann JF, Belmin J (2015) Antiarrhythmics for maintaining sinus rhythm after cardioversion of atrial fibrillation. Cochrane Database Syst Rev (3): Cd005049.
29. Calkins H, Reynolds MR, Spector P, Sondhi M, Xu Y et al. (2009) Treatment of atrial fibrillation with antiarrhythmic drugs or radiofrequency ablation: two systematic literature reviews and meta-analyses. Circ Arrhythm Electrophysiol 2 (4): 349-361.
30. Bruggenjurgan B, Kohler S, Ezzat N, Reinhold T, Willich SN (2013) Cost effectiveness of antiarrhythmic medications in patients suffering from atrial fibrillation. Pharmacoeconomics 31 (3): 195-213.
31. Nilsson J, Akerborg O, Bego-Le Bagousse G, Rosenquist M, Lindgren P (2013) Cost-effectiveness analysis of dronedarone versus other anti-arrhythmic drugs for the treatment of atrial fibrillation--results for Canada, Italy, Sweden and Switzerland. Eur J Health Econ 14 (3): 481-493.
32. Akerborg O, Nilsson J, Bascle S, Lindgren P, Reynolds M (2012) Cost-effectiveness of dronedarone in atrial fibrillation: results for Canada, Italy, Sweden, and Switzerland. Clin Ther 34 (8): 1788-1802.
33. Berman A., Kabiri M., Wei T., et al. (2022). Economic and Health Value of Delaying Atrial Fibrillation Progression Using Radiofrequency Catheter Ablation Manuscript Circulation: Arrhythmia and Electrophysiology.
34. Mark DB, Anstrom KJ, Sheng S, Piccini JP, Baloch KN, Monahan KH, Daniels MR, Bahnson TD, Poole JE, Rosenberg Y, Lee KL, Packer DL; CABANA Investigators. Effect of Catheter Ablation vs Medical Therapy on Quality of Life Among Patients With Atrial Fibrillation: The CABANA Randomized Clinical Trial. JAMA. 2019 Apr 2;321(13):1275-1285. doi: 10.1001/jama.2019.0692. Erratum in: JAMA. 2019 Jun 18;321(23):2370. PMID: 30874716; PMCID: PMC6450275.
35. Hussein A, Das M, Chaturvedi V, Asfour IK, Daryanani N et al. (2017) Prospective use of Ablation Index targets improves clinical outcomes following ablation for atrial fibrillation. J Cardiovasc Electrophysiol 28 (9): 1037-1047.
36. Taghji P, El Haddad M, Philips T, Wolf M, Knecht S et al. (2018) Evaluation of a Strategy Aiming to Enclose the Pulmonary Veins With Contiguous and Optimized Radiofrequency Lesions in Paroxysmal Atrial Fibrillation: A Pilot Study. JACC Clin Electrophysiol 4 (1): 99-108.
37. Philips T, Taghji P, El Haddad M, Wolf M, Knecht S et al. (2018) Improving procedural and one-year outcome after contact force-guided pulmonary vein isolation: the role of interlesion distance, ablation index, and contact force variability in the 'CLOSE'-protocol. Europace 20 (F1_3): f419-f427
38. Zeitler EP, Bunch TJ, Khanna R, et al. "Comparative risk of dementia among patients with atrial fibrillation treated with catheter ablation versus anti-arrhythmic drugs". American Heart Journal. (2022).
39. Noseworthy PA, Gersh BJ, Kent DM, et al. Atrial fibrillation ablation in practice: assessing CABANA generalizability. Eur Heart J. 2019;40(16):1257-1264. doi:10.1093/eurheartj/ehz085.
40. Packer DL, Mark DB, Robb RA, et al. Effect of Catheter Ablation vs Antiarrhythmic Drug Therapy on Mortality, Stroke, Bleeding, and Cardiac Arrest Among Patients With Atrial Fibrillation: The CABANA Randomized Clinical Trial. JAMA. 2019;321(13):1261-1274.
41. Osorio J, Mansour M, Melby D, et al. "Economic Evaluation of Contact Force Catheter Ablation for Persistent Atrial Fibrillation in the United States". Heart Rhythm. (2022).
42. Gupta D, Vijgen J, De Potter T, et al. (2021) Quality of life and healthcare utilisation improvements after atrial fibrillation ablation. BMJ 109(16): 1296-1302.
43. Mansour, et al. The prospective multicenter PRECEPT Trial JACC EP 2020 Aug, 6 (8)958-969.
44. Duytschaever M, Vijgen J, De Potter T, Scherr D, Van Herendael H et al. (2020) Standardized pulmonary vein isolation workflow to enclose veins with contiguous lesions: the multicentre VISTAX trial. EP Europace 22 (11) 1645 1652.
45. K.H. Kuck, D. S. Lebedev, E. N. Mikhaylov, et al. Catheter ablation or medical therapy to delay progression of atrial fibrillation: the randomized controlled atrial fibrillation progression trial (ATTEST), EP Europace, 23(3), March 2021, 362-369a, <https://doi.org/10.1093/europace/eaab298>
46. Blomström-Lundqvist C, Gizurarson S, Schwieler J, et al. Effect of Catheter Ablation vs Antiarrhythmic Medication on Quality of Life in Patients With Atrial Fibrillation: The CAPTAF Randomized Clinical Trial. JAMA. 2019
47. Doshi A., Maccioni S., Preethi S.M., Khanna, R. Catheter Ablation Using Advanced Porous Tip Contact-Force Sensing Radiofrequency Catheter: Impact on Healthcare Utilization Among Patients with Persistent Atrial Fibrillation. Heart Rhythm O2. DOI: <https://doi.org/10.1016/j.hrthm.2022.07.003>.
48. Lakkireddy, D. Impact of an organized treatment pathway on atrial fibrillation patients from the emergency room to electrophysiology service (ER2EPstudy). (2022).
49. Robinson A, Amin AK, Billakanty SR, et al. (2021). Heart Rhythm; B-PO04-110; Vol. 18, No. 8:S324
50. Bowyer JL, Tully PJ, Ganesan AN, et al. (2017). Heart Lung Circ; Vol. 26: 73–81. doi: 10.1016/j.hlc.2016.04.024. PMID: 27423977.
51. De Greef, Y., et al. Diagnosis-to-ablation time as a predictor for success: Early choice for pulmonary vein isolation and long-term outcome in atrial fibrillation: Results from the Middelheim-PVI Registry. Europace (2018), 20(4):589-595.
52. Bunch TJ, May HT, Bair TL, et al. Increasing time between first diagnosis of atrial fibrillation and catheter ablation adversely affects long-term outcomes. Hear Rhythm. 2013;10(9):1257-1262. doi:10.1016/j.hrthm.2013.05.013.
53. Poole JE, Bahnson TD, Monahan KH, Johnson G, Rostami H et al. (2020) Recurrence of Atrial Fibrillation After Catheter Ablation or Antiarrhythmic Drug Therapy in the CABANA Trial. J Am Coll Cardiol. 75(25):3105-3118.

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